

BEST AVAILABLE COPYApplication No.: 10/810,634Docket No.: 2336-256**REMARKS**

Applicants appreciate the Examiner's thorough review of the present application, and respectfully request reconsideration in light of the preceding amendments and the following remarks.

Claims 1-18 are pending in the application. The original claims are unchanged notwithstanding the Examiner's art rejections. New claims 6-18 have been added to provide Applicants with the scope of protection to which they are believed entitled. The Abstract has been revised to be compliant with commonly accepted US patent practice. No new matter has been introduced through the foregoing amendments.

The 35 U.S.C. 103(a) rejection of claim 1 as being obvious over *Ishikawa* (U.S. Patent No. 6,583,032) in view of *Chen* (U.S. Patent No. 6,221,751) is traversed, because the references singly or in combination fail to disclose, teach or suggest all limitations of the rejected claim, especially the dry-etching step of claim 1.

The Examiner alleges that *Ishikawa* teaches the claimed step in FIGs. 1-11 and at column 6, lines 8-23. However, the cited portions fail to teach or suggest any dry-etching step, merely mentioning that the broken layer can be removed by at least one of polishing and etching. Applicants further note that *Ishikawa* teaches the opposite, i.e., wet-etching, rather than dry-etching, at column 5, line 14. This deficiency of *Ishikawa* is not deemed curable by the teaching reference of *Chen*. Therefore, Applicants respectfully submit that claim 1 is patentable over *Ishikawa* and *Chen*, and request that the 35 U.S.C. 103(a) rejection of claim 1 be withdrawn.

The 35 U.S.C. 103(a) rejection of claims 2-5 should be withdrawn for at least the reason advanced with respect to claim 1 from which claims 2-5 depend.

New independent claim 6 is directed to a method of separating a sapphire wafer, on which

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semiconductor elements are formed, into unit chips, said method comprising the steps of: (a) grinding a rear surface of the sapphire wafer so that the sapphire wafer has a first designated thickness; (b) lapping the rear surface of the ground sapphire wafer so that the sapphire wafer has a second designated thickness smaller than the first designated thickness; (c) dry-etching the rear surface of the lapped sapphire wafer so that the sapphire wafer has a uniform thickness and a processing stress of the rear surface of the dry-etched sapphire wafer is maintained at a designated level; and (d) scribing the rear surface of the dry-etched sapphire wafer.

New independent claim 6 is patentable over the applied references, because the references singly or in combination fail to disclose, teach or suggest at least the highlighted limitation of claim 6. As disclosed in the specification of the instant application, by maintaining the processing stress of the rear surface of the dry-etched sapphire wafer at a designated level, the scribing step can be performed more efficiently without excessive abrasion of the scribing tool. *See* pages 14-15 of the specification. In contrast, the applied references, especially *Ishikawa*, require that the broken layer formed on the wafer's rear surface due to the grinding process be completely removed. This will necessarily result in a smooth wafer's rear surface like in the conventional art discussed at the beginning of the specification of the instant application. The *Ishikawa* scribing tool will therefore cut into said smooth surface and suffer excessive abrasion like the conventional art. Accordingly, Applicants respectfully submit that the applied references do not teach and cannot obtain the advantage of the invention of claim 6.

New claim 6 is therefore patentable over that art. New claims 7-14 depend from claim 6, and are considered patentable at least for the reason advanced with respect to claim 6.

New claim 15 is directed to a method of separating a sapphire wafer, on which semiconductor elements are formed, into unit chips, said method comprising the steps of: (a) grinding a rear surface of the sapphire wafer so that the sapphire wafer has a first designated thickness; (b) lapping the rear surface of the ground sapphire wafer so that the sapphire wafer has a

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second designated thickness smaller than the first designated thickness; (c) dry-etching the rear surface of the lapped sapphire wafer so that the sapphire wafer has a uniform thickness and a processing stress of the rear surface of the dry-etched sapphire wafer is maintained at a designated level; and (d) scribing the rear surface of the dry-etched sapphire wafer with a diamond tip; wherein said dry-etching is performed after said lapping without a polishing process between said lapping and said dry-etching; after said lapping, the rear surface of said lapped sapphire wafer includes at least one scratch; and said dry-etching is performed to reduce a depth of said at least one scratch, without completely removing said at least one scratch, thereby maintaining a processing stress of the rear surface of the dry-etched sapphire wafer at a sufficiently high level that facilitates cutting of said rear surface of the dry-etched sapphire wafer with the diamond tip in said scribing step.

New independent claim 15 is patentable over the applied references, because the references singly or in combination fail to disclose, teach or suggest at least the highlighted limitations of claim 15. As disclosed in the specification of the instant application, by maintaining the processing stress of the rear surface of the dry-etched sapphire wafer at a sufficiently high level by not using a polishing step, the scribing step can be performed more efficiently without excessive abrasion of the scribing tool. *See* pages 14-15 of the specification. In contrast, the applied references, especially *Ishikawa*, require that the broken layer formed on the wafer's rear surface due to the grinding process be completely removed. This will necessarily result in a smooth wafer's rear surface like in the conventional art discussed at the beginning of the specification of the instant application. The *Ishikawa* scribing tool will therefore cut into said smooth surface and suffer excessive abrasion like the conventional art. Accordingly, Applicants respectfully submit that the applied references do not teach and cannot obtain the advantage of the invention of claim 15.

New claim 15 is therefore patentable over that art. New claims 16-18 depend from claim 15, and are considered patentable at least for the reason advanced with respect to claim 15.

Each of the Examiner's rejections has been traversed. Accordingly, Applicants respectfully

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submit that all claims are now in condition for allowance. Early and favorable indication of allowance is courteously solicited.

The Examiner is invited to telephone the undersigned, Applicant's attorney of record, to facilitate advancement of the present application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 07-1337 and please credit any excess fees to such deposit account.

Respectfully submitted,

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